



AGRICULTURAL COMPLIANCE STATEMENT

Vrede Solar Photovoltaic Facility

De Aar, Northern Cape

April 2023

CLIENT



Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax : +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com



Table of Contents

1	Introduction	3
1.1	Project Description	3
1.2	Background	3
1.3	Presentation	4
1.4	Specialist Details	5
1.5	Legislative Framework.....	5
1.6	Limitations	6
2	Scope of Work.....	7
3	Key Legislative Requirements.....	7
4	Methods	8
4.1	Desktop Assessment.....	8
4.2	Site Assessment.....	8
4.3	Sensitivity	8
5	Results & Discussion	9
5.1	Desktop Assessment.....	9
5.1.1	Land Capability.....	9
5.1.2	Geology and Soil	9
5.2	Vrede Solar Photovoltaic Facility Summary	10
5.3	Sensitivity Verification.....	12
6	Impact Statement	12
6.1	Mitigation Measures	13
7	Conclusion	13
7.1	Impact Statement	13
8	References.....	14
9	Appendix Items	15
9.1	Appendix A – Specialist Declaration of Independence.....	15

List of Tables

Table 1-1	The project name, farm portion and accompanying capacity for the Crossroads Green Energy Solar PV Cluster	4
Table 1-2	Agricultural Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report	6
Table 3-1	A list of key legislative requirements relevant to biodiversity and conservation in the Northern Cape.....	7
Table 4-6	National Land Capability Values (DAFF, 2017)	8
Table 5-5	The descriptions for the broad land types (Land Type Survey Staff, 1972 - 2006)	10
Table 5-2	Soils expected at the respective terrain units within the Ae 138 land type (Land Type Survey Staff, 1972 - 2006)	11

List of Figures

Figure 1-1	The agricultural theme sensitivity.....	4
Figure 5-1	The land capability sensitivity for the PAOI	9
Figure 5-2	Illustration of broad land types for the PAOI (Land Type Survey Staff, 1972 - 2006) ...	10
Figure 5-3	Illustration of land type Ae 138 terrain unit (Land Type Survey Staff, 1972 - 2006).....	11
Figure 5-3	Photographs of soil characteristics identified for the area. A) Shallow profiles with lithic and hard rock horizons. B) Young profiles in the lower terrains associated to neocutanic horizons. C,D) Apedal horizons in the terrain with the occurrence of red apedal horizons.	11
Figure 5-4	Land Capability Sensitivity (DAFF, 2017)	12

1 Introduction

1.1 Project Description

A consortium consisting of Akuo Energy Afrique, Africoast Investments and Golden Sunshine Trading propose to develop the Solar Photovoltaic (PV) Facility and its associated electrical infrastructure on Portion 5 of the Farm Bas Berg 88 in the Renosterberg Local Municipality in the greater Pixley ka Seme District Municipality in the Northern Cape Province. The project site is located approximately 20km north of Philipstown and 30km west of Petrusville and within the Central Transmission Corridor. The Project (Vrede Solar PV Facility) is part of a cluster known as the Crossroads Green Energy Solar PV Cluster. The Cluster entails the development of up to Twenty-one (21) solar energy facilities. Each is considered within a separate environmental application process.

A technically suitable project site of ~1102ha has been identified by Akuo Energy Afrique for the establishment of the Vrede Solar PV Facility. The proposed facility will have a contracted capacity of 150MW and will include the following infrastructure:

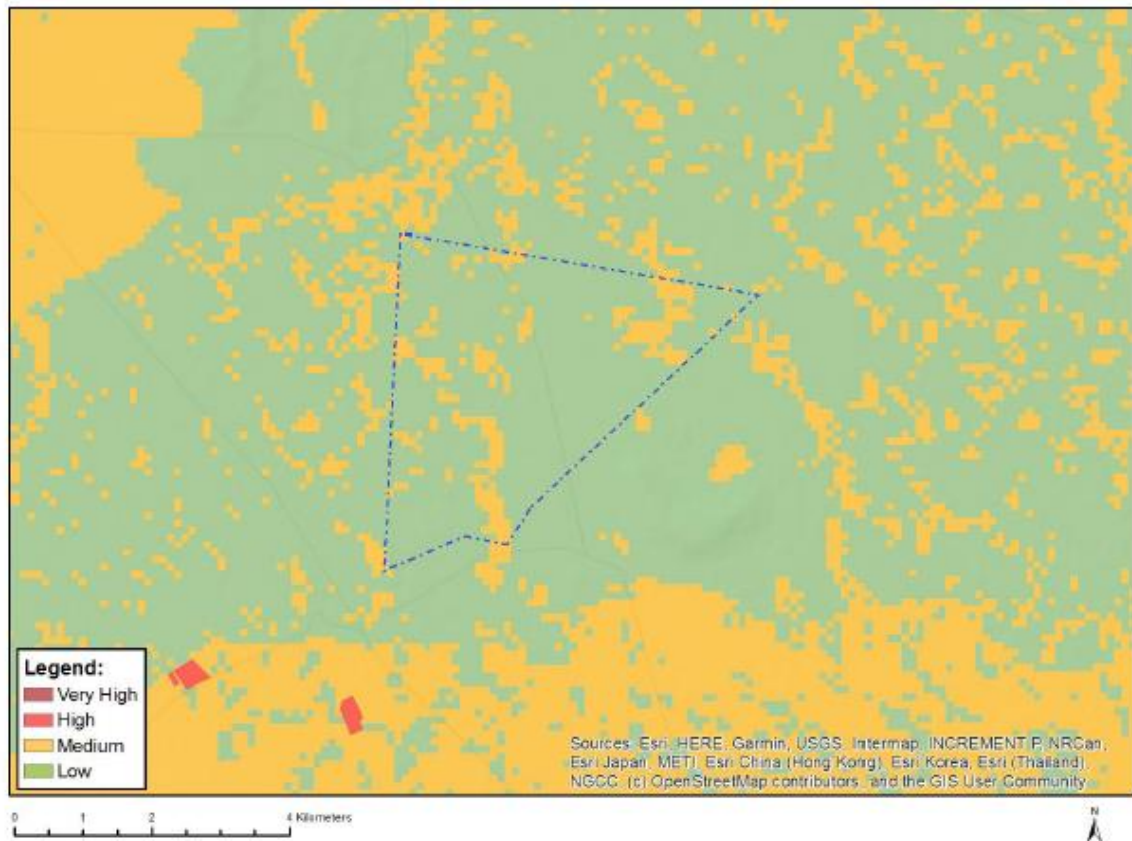
- Solar PV array comprising PV modules and mounting structures (monofacial or bifacial and a single axis tracking system);
- Inverters and transformers;
- Cabling between the project components;
- Battery Energy Storage System (BESS);
- On-site facility substation and power lines between the solar PV facility and the Eskom substation (to be confirmed and assessed through a separate process);
- Site offices, Security office, operations and control, and maintenance and storage laydown areas; and
- Access roads, internal distribution roads.

1.2 Background

The Biodiversity Company was appointed to undertake an agricultural potential (agricultural theme) assessment for the proposed PV solar development. The project area refers to the farm portions whereas the developable area refers to the proposed footprint area for the PV facility.

The approach was informed by the Environmental Impact Assessment Regulations, 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach is in accordance with the recently published Government Notices 320 (20 March 2020) in terms of NEMA, dated 20 March and 30 October 2020: "*Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation*" (Reporting Criteria). The National Web based Environmental Screening Tool classifies the agricultural theme sensitivity for the area as ranging from "Medium" to "Low" for the developable area.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

Figure 1-1 The agricultural theme sensitivity

1.3 Presentation




The Project Area of Influence (PAOI) comprises the collective extent of the farms proposed for the Crossroads Green Energy Solar PV Cluster. The baseline information presented herein pertains to the PAOI. The table below presents the project names which comprise the cluster development, and the corresponding farm portions and planned capacity. A summary of ecological features specific to the Vrede Solar Photovoltaic Facility is provided in this report. Further to this, impacts expected for the development of renewable energy projects in the area have also been presented.

Table 1-1 The project name, farm portion and accompanying capacity for the Crossroads Green Energy Solar PV Cluster

No	Project name	Farm Name and portion Number	Capacity
1	Tafelkop Solar PV Facility	Portion 3 of the Farm Grass Pan 40	240MW

2	Koppy Alleen Solar PV Facility	Portion 5 of the Farm Koppy Alleen 83	100MW
3	Vrede Solar PV Facility	Portion 5 of the Farm Bas Berg 88	150MW
4	Zionsheuvell Solar PV Facility	Remainder of Farm Leeuwing 79	240MW
5	Amper Daar Solar PV Facility	Remainder of Farm Wolwe Kuil 44	100MW
6	Wag-'n-Bietjie Solar PV Facility	Portion 1 of the Farm Leeuwe Berg 45	100MW
7.1	Ruspoort 1 Solar PV Facility (Option A)	Portion 5 of the Farm Bokken Kraal 81 (Option A)	100MW
7.2	Ruspoort 1 Solar PV Facility (Option B)	Portion 4 on the Farm Knoffelfontein 74 Portion 1 on the Farm 78 Portion 2 on the Farm Leeuwing 79 (Option B)	100MW
8	Ruspoort 2 Solar PV Facility	Portion 2 of the Farm Leeuwing 79	100MW
9	Middelplaas Solar PV Facility	Portion 4 of the Farm Grass Pan 40	100MW

1.4 Specialist Details

Report Name	AGRICULTURAL COMPLIANCE STATEMENT
Reference	Vrede Solar Photovoltaic Facility
Submitted to	
Report Contributor	<p>Matthew Mamera </p> <p>Matthew Mamera is a Cand. Sci Nat registered (116356) in natural and agricultural sciences recognized in soil science. Matthew is a soil and hydrogeology specialist with experience in soil, pedology, hydrogeology, water and sanitation management and land contamination and has field experience and numerous peer reviewed scientific publications in international journals. Matthew completed his M.Sc. in soil science, hydrogeology and water management at the University of Fort Hare, Alice. He is also a holder of a PhD in soil science, hydrogeology, water and sanitation obtained at the University of the Free State, Bloemfontein. Matthew is also a member of the Soil Science Society of South Africa (SSSSA).</p>
Reviewer	<p>Andrew Husted </p> <p>Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.</p>
Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>

1.5 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on

Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation” – the following has been assumed:

- An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of “medium” or “low” sensitivity for agricultural resources must submit an Agricultural Compliance Statement unless:
 - the information gathered from the site sensitivity verification differs from that identified as having a “medium” or “low” agricultural sensitivity and it is found to be of a “very high” or “high” sensitivity; or
 - where the development footprint deviates from any of the allowable development limits. In the context of this protocol, development footprint means the area on which the proposed development will take place and includes any area that will be disturbed.

An Agricultural Compliance Statement must contain the information as presented in Table 1-2 below.

Table 1-2 *Agricultural Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report.*

GNR 320 of 2020, Ref.:	Item	Report Section:
3.3.1	Contact details and relevant expertise as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae;	
3.3.2	A signed statement of independence by the specialist;	
3.3.3	A map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool;	
3.3.4	Confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities;	
3.3.5	A substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval or not, of the proposed development;	
3.3.6	Any conditions to which the statement is subjected;	
3.3.7	In the case of a linear activity, a confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	N/A
3.3.8	Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	
3.3.9	A description of the assumptions made as well as any uncertainties or gaps in knowledge or data; and	
3.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	N/A

1.6 Limitations

The following limitations should be noted for the assessment:

- The assessment area was based on the area provided by the client and any alterations to the footprint and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The priority for the statement was the developable areas; and
- The assessment area was based on the spatial file provided by the client and any alterations to the development area may affect the results.

2 Scope of Work

According to the National Web based Environmental Screening Tool, the proposed development is located within “Low” to “Medium” sensitivities. The protocols for minimum requirements (DEA, 2020)¹ stipulates that in the event that a proposed development is located within “Low” or “Medium” sensitivities, an agricultural compliance statement will be sufficient. It is worth noting that according to these protocols, a site inspection will still need to be conducted to determine the accuracy of these sensitivities. After acquiring baseline information pertaining to soil resources within the 50 m regulated areas, it is the specialist’s opinion that the soil forms and associated land capabilities concur with the sensitivities stated by the screening tool. Therefore, only an agricultural compliance statement will be compiled. This includes:

- The feasibility of the proposed activities;
- Confirmation about the “Low” and “Medium” sensitivities;
- The effects that the proposed activities will have on agricultural production in the area;
- A map superimposing the proposed footprint areas, a 50 m regulated area as well as the sensitivities pertaining to the screening tool;
- Confirmation that no agricultural segregation will take place and that all options have been considered to avoid segregation;
- The specialist’s opinion regarding the approval of the proposed activities;
- Indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the area; and
- Any potential mitigation measures described by the specialist to be included in the management programme.

3 Key Legislative Requirements

The legislation listed below in Table 3-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 3-1 *A list of key legislative requirements relevant to biodiversity and conservation in the Northern Cape*

Region	Legislation / Guideline
National	Constitution of the Republic of South Africa (Act No. 108 of 1996)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 320 of Government Gazette 43310 (March 2020)
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	National Biodiversity Framework (NBF, 2009)

¹ A site identified by the screening tool as being of ‘High’ or ‘Very High’ sensitivity for agricultural resources must submit a specialist assessment unless the impact on agricultural resources is from an electricity pylon (item 1.1.2).

	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)
	National Water Act (NWA) (Act No. 36 of 1998)
	Alien and Invasive Species Regulations and, Alien and Invasive Species List 2014/2020, published under NEMBA
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)
	Northern Cape Nature Conservation act no. 9 of 2009
Provincial	Northern Cape Planning and Development Act no. 7 of 1998

4 Methods

4.1 Desktop Assessment

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets to develop digital cartographs. These include the:

- South African Land Type Data. Land type data was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 - 2006);
- The National Land Capability Evaluation Raster Data Layer was obtained from the DAFF to determine the land capability classes of the area. The data was developed using a spatial evaluation modelling approach (DAFF, 2017).

4.2 Site Assessment

A site assessment was completed in June 2022. Soil characteristics were determined on site, accompanied by photographs. The combination of desktop data and site results were used to determine the site sensitivity verification for the project.

4.3 Sensitivity

The land capability of the proposed footprint was compared to the National Land Capability which was refined in 2014- 2016. The National Land Capability methodology is based on a spatial evaluation modelling approach and a raster spatial data layer consisting of fifteen (15) land capability evaluation values (Table 4-1), usable on a scale of 1:50 000 – 1:100 000 (DAFF, 2017). The previous system is based on a classification approach, with 8 classes.

Table 4-1 National Land Capability Values (DAFF, 2017)

Land Capability Evaluation Value	Land Capability Description
1	Very low
2	
3	Very Low to Low
4	
5	Low
6	Low to Moderate
7	
8	Moderate
9	Moderate to High

10	
11	High
12	High to Very High
13	
14	Very High
15	

5 Results & Discussion

5.1 Desktop Assessment

5.1.1 Land Capability

As part of the desktop assessment, soil information was obtained using published South African Land Type Data. Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 - 2006). The land type data is presented at a scale of 1:250 000 and comprises of the division of land into land types. The overall land capability sensitivity for the area ranges from low to medium (Figure 5-1).



Figure 5-1 The land capability sensitivity for the PAOI

5.1.2 Geology and Soil

According to the land type database (Land Type Survey Staff, 1972 - 2006), the PAOI is located in the Ae, Da, Fb and Ib broad land types. The Ae land type consists of red-yellow apedal soils which are freely drained. The soils tend to have a high base status and is deeper than 300 mm. The Da land type is characterised by prisma-cutanic and/or pedocutanic horizons with the possibility of red apedal B-horizons occurring. The Fb land type consists of Glenrosa and/or Mispah soil forms with the possibility

of other soils occurring throughout. Lime is generally present within the entire landscape. The Ib land type consists of miscellaneous land classes including rocky areas with miscellaneous soils.

The broad land types for the area are illustrated in Figure 5-2 with a description of the land types listed in Table 5-1.

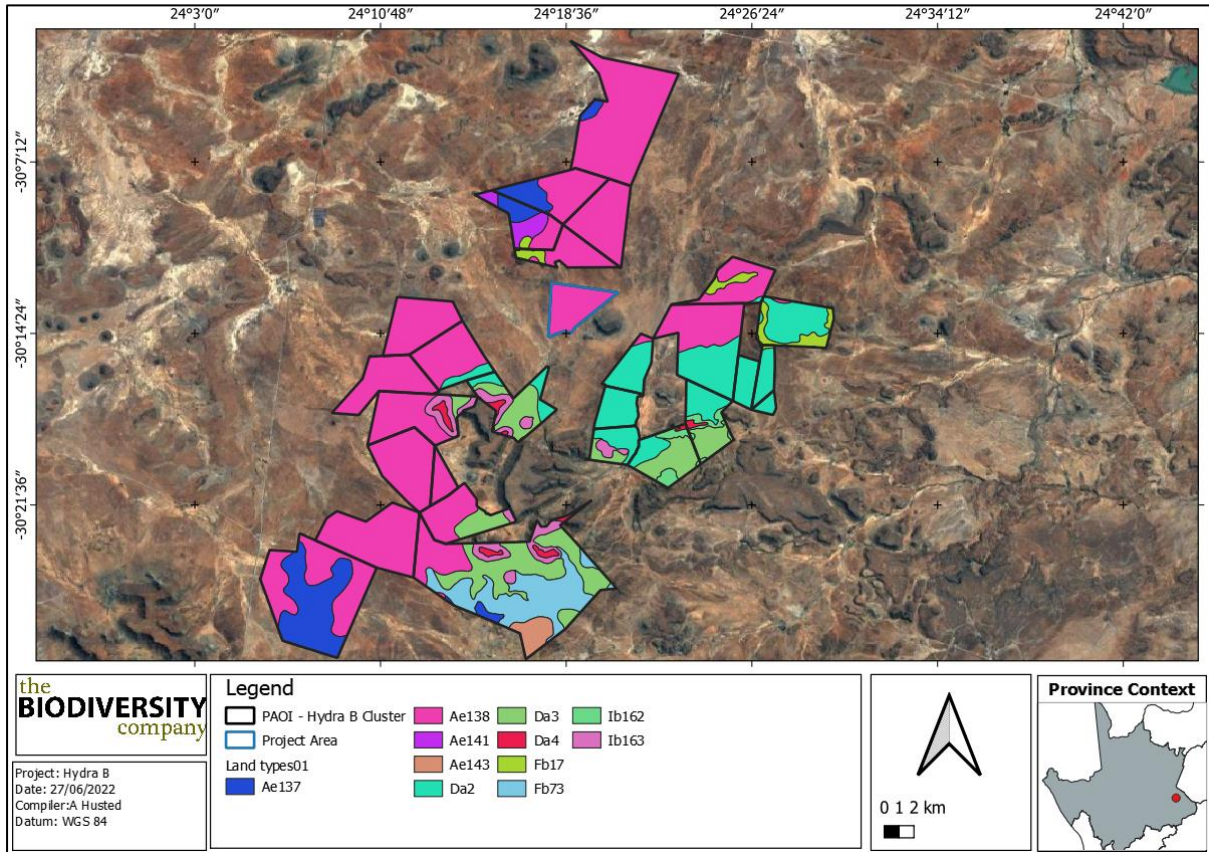


Figure 5-2 Illustration of broad land types for the PAOI (Land Type Survey Staff, 1972 - 2006)

Table 5-1 The descriptions for the broad land types (Land Type Survey Staff, 1972 - 2006)

Land Type	Description
Ae	RED-YELLOW APEDAL, FREELY DRAINED SOILS; Red, high base status > 300 mm deep (no dunes)
Da	PRISMACUTANIC AND/OR PEDOCUTANIC DIAGNOSTIC HORIZONS DOMINANT; Red B horizons
Fb	GLENROSA AND/OR MISPAH FORMS (other soils may occur); Lime rare or absent in upland soils but generally present in low-lying soils
Ib	MISCELLANEOUS LAND CLASSES; Rock areas with miscellaneous soils

5.2 Vrede Solar Photovoltaic Facility Summary

The developable area is located in the Ae138 land type. The Ae land types are characterized with Hutton, Oakleaf and Mispah soil forms according to the Soil Classification Working Group, (1991) with the possibility of other soils and bare rocky areas. The Da land types are commonly associated to Sterkspruit and Valsrivier soil forms with the occurrence of rocky areas also including other soils within the terrain. The Ae land type consists of red to yellow apedal soils which are freely drained. The soils tend to have a high base status and are deeper than 300 mm. The land terrain for Ae 138 land type unit is illustrated in Figure 5-3 with the expected soils listed in Table 5-2. Soils associated to the landscapes for the general area are presented in Figure 5-4.

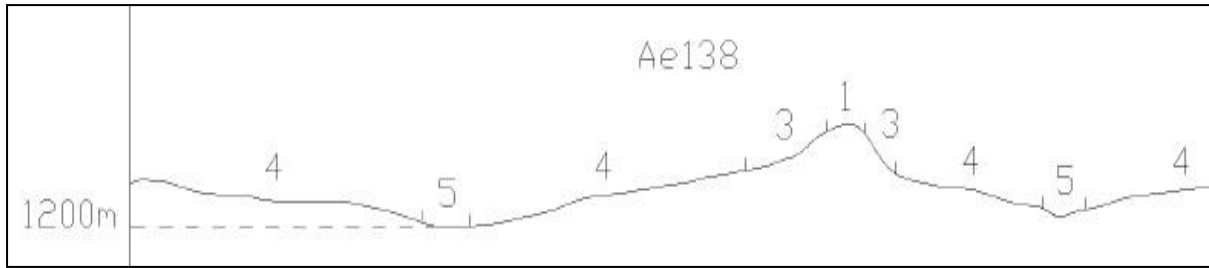


Figure 5-3 Illustration of land type Ae 138 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 5-2 Soils expected at the respective terrain units within the Ae 138 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (3%)		3 (20%)		4 (75%)		5 (2%)	
Bare Rock	40%	Hutton	70%	Hutton	85%	Oakleaf	40%
Hutton	30%	Mispah	15%	Mispah	10%	Swartland	25%
Mispah	30%	Swartland	10%	Swartland	5%	Valsrivier	20%
		Mispah	5%			Hutton	10%
						Streambeds	5%

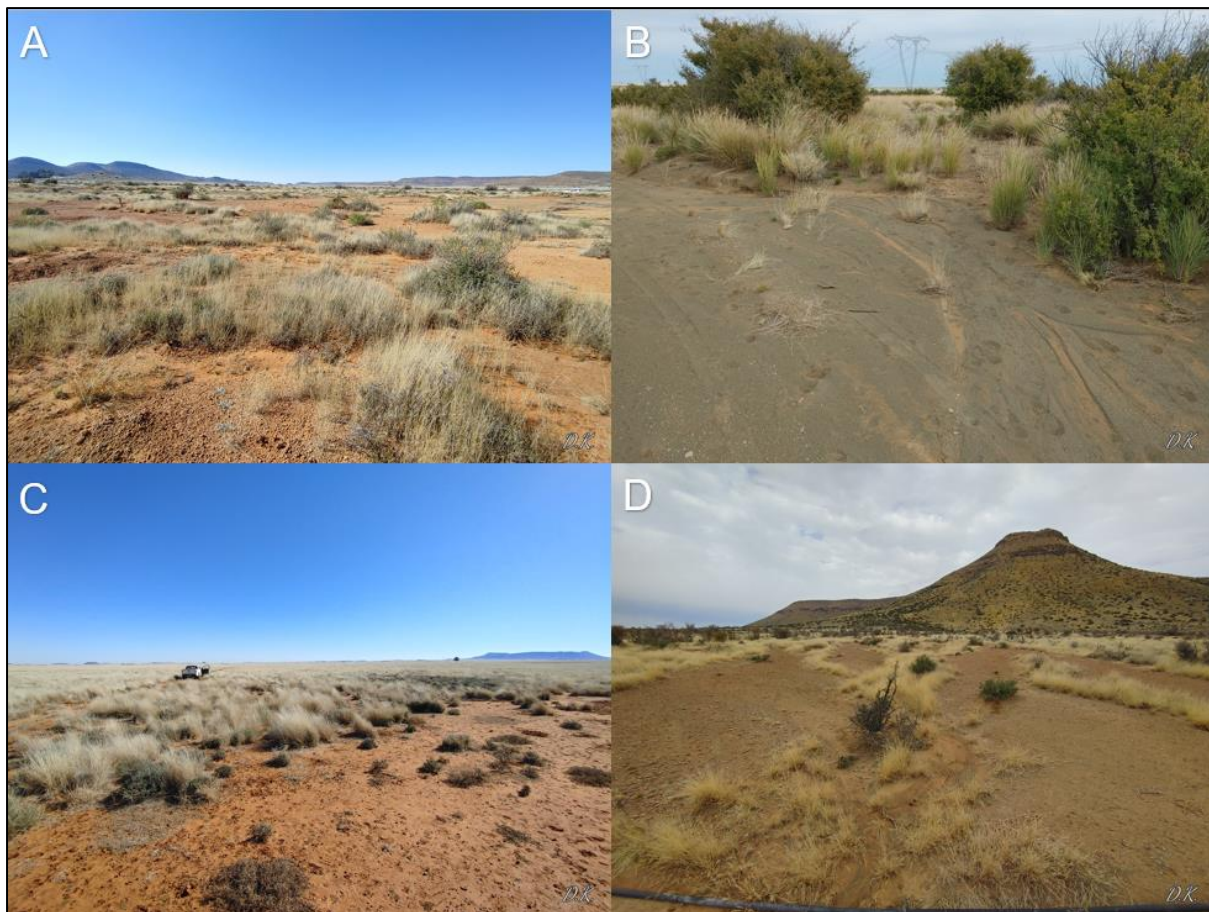


Figure 5-4 Photographs of soil characteristics identified for the area. A) Shallow profiles with lithic and hard rock horizons. B) Young profiles in the lower terrains associated to neocutanic horizons. C, D) Apedal horizons in the terrain with the occurrence of red apedal horizons.

5.3 Sensitivity Verification

Fifteen land capabilities have been digitised by (DAFF, 2017) across South Africa, of which eight are located within the proposed development area, including;

- Land Capability 1 to 5 (Very Low to Low Sensitivity); and
- Land Capability 6 to 8 (Low/Moderate to Moderate Sensitivity).

The baseline findings and the sensitivities as per the Department of Agriculture, Forestry and Fisheries (DAFF, 2017) national raster file concur with one another. It therefore is the specialist's opinion that the land capability and land potential of the resources in the project area ranges from "Very Low" to "Moderate" (see Figure 5-5), which conforms to the requirements of an Agricultural Compliance Statement only.

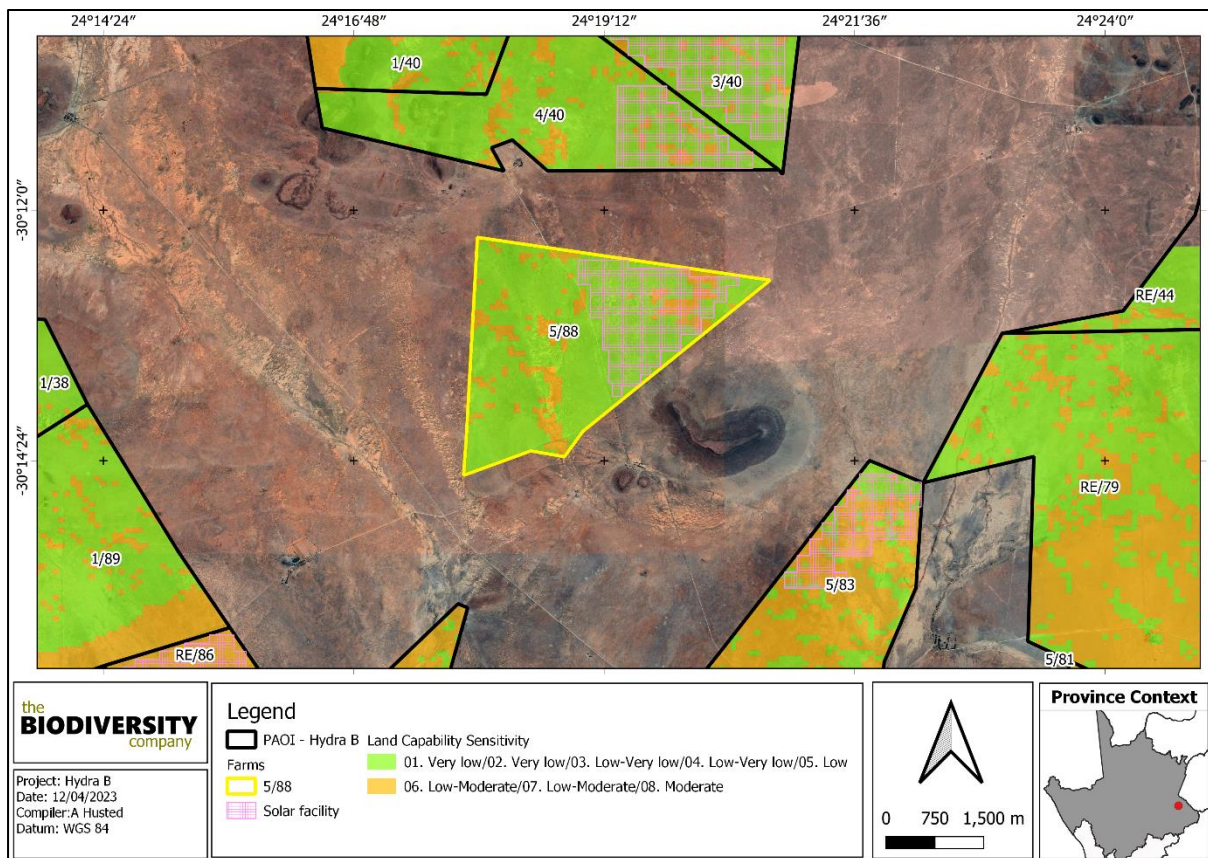


Figure 5-5 Land Capability Sensitivity (DAFF, 2017)

6 Impact Statement

It is the specialist's opinion that the baseline findings concur with the land capabilities identified by means of the DAFF (2017) desktop findings regarding land capability sensitivities. No "High" land capability sensitivities were identified within the developable area. Considering the relatively medium to low sensitivities, it is the specialist's opinion that the proposed activities will have an acceptable level of impact on agricultural productivity for the area. Furthermore, no measures regarding moving components in their micro-setting are required to avoid or minimise fragmentation and disturbances of agricultural activities.

6.1 Mitigation Measures

The following general mitigation measures have been prescribed. Even though the land potential and land capability in the area is of medium to low sensitivity, the following measures will ensure the conservation of soil resources;

- Demarcate areas to be stripped of topsoil. Keep these areas to an absolute minimum;
- Compacted areas are to be ripped to loosen the soil structure;
- The extent of vegetation clearance must be kept to a minimum. A vegetative cover must remain beneath the panels;
- All waste must be removed from the area, and disposed of at a licenced facility (where applicable);
- All laydown yards must be constructed within the shallow soil and bare rock areas;
- Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks; and
- If a spill occurs, it is to be cleaned up immediately and reported to the appropriate authorities.

7 Conclusion

The most sensitive soil forms that can be expected within the assessment corridor is the Hutton and Oakleaf soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with “Very Low to Moderate” sensitivities, which correlates with the requirements for a compliance statement only.

The available climate can limit crop production significantly. The harsh climatic conditions are associated with low annual rainfall and high evapotranspiration potential demands of the area. The area is not favourable for most cropping practices.

The proposed project will have limited impact on the agricultural production ability of the land. Additionally, the solar facility and associated infrastructure will not result in the segregation of any high production agricultural land.

7.1 Impact Statement

No fatal flaws were identified for the project. It is the specialist’s opinion that the proposed activities may proceed as have been planned without the concern of loss of high sensitivity land capabilities or agricultural productivity for the developable area.

8 References

Department of Agriculture, Forestry and Fisheries, 2017. National land capability evaluation raster data: Land capability data layer, 2017. Pretoria.

Land Type Survey Staff. 1972 - 2006. Land Types of South Africa: Digital Map (1:250 000 Scale) and Soil Inventory Databases. Pretoria: ARC-Institute for Soil, Climate, and Water.

Mucina, L., & Rutherford, M. C. 2006. The Vegetation of South Africa, Lesotho, and Swaziland. Strelitzia 19. Pretoria: National Biodiversity Institute.

SASA, S. A. 1999. Identification & management of the SOILS of the South African sugar industry. Mount Edgecombe: South African Sugar Association Experiment Station.

Smith, B. 2006. The Farming Handbook. Netherlands & South Africa: University of KwaZulu-Natal Press & CTA.

Soil Classification Working Group. 1991. Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

Soil Classification Working Group. 2018. Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

9 Appendix Items

9.1 Appendix A – Specialist Declaration of Independence

I, Matthew Mamera, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations, and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Dr Matthew Mamera

Soil Science Specialist

The Biodiversity Company

April 2023